lower sequence includes rocks of Eocene to older Miocene age. It is more than 10,000 feet thick in the Santa Cruz basin, but thins southwest. Several thousand feet of the lower sequence are present in the Hollister basin but are absent on the Gilroy shelf.

The upper sequence includes rocks of younger Miocene to Pliocene age. The sequence is thickest in the area of Half Moon Bay (10,000+ feet), and in the Hollister basin (8,000+ feet). It is 1,000–3,000 feet thick over the Ben Lomond-Gabilan shelf and less than 1,000 feet thick on the Gilroy shelf.

The primary feature of structural importance is the right lateral San Andreas fault. The Santa Cruz basin proper is a highly mobile belt between two moving buttresses—the Ben Lomond granite mass and the Gilroy Franciscan shelf. There were two episodes of intense structural deformation—one at the end of lower sequence deposition, and one during the Pleistocene and Recent epochs.

The region has been prospected for oil since 1886. A period of intense exploration since World War II has resulted in several oil and gas discoveries of some importance in the last 5 years. Because of the structural history of the region, it is believed that prospecting will be most successful where searching for structural and stratigraphic traps formed prior to the more recent deformation.

ROBERT B. MORAN, JR., Moran Instrument Corporation, Pasadena, California
Radiation Logging in Shallow Bore Holes

In the half century that has elapsed since a French physicist discovered that gamma rays would fog a photographic plate, much progress has been made in the field of nuclear physics and instrumentation. Commercial gamma-logging service for oil wells has been offered for the past 15 years and during the past 5 years, considerable work has been done by the A.E.C. and others, in the development of slim-hole-logging equipment for use in exploration for radioactive minerals.

Gamma rays are the most penetrating form of natural radiation given off by the daughter products of uranium, thorium, and potassium. Traces of these elements occur in varying amounts in all common rocks, so that the gamma log has become a valuable geophysical tool both for stratigraphic correlation and for the determination of the presence of radioactive material.

During 1955, 5½ million feet of exploratory shallow holes were drilled in the search for uranium in the United States. The development of reliable scintillation-logging equipment has now made it possible rapidly to assay radioactive ore bodies in place, and at the same time, produce a stratigraphic log of overlying barren formations. These data can be correlated between holes to give a geological structure map. Because of improved gamma-logging instruments which are now available, and the greater experience which mining operators have in interpreting the logs, it is now possible accurately to evaluate a buried ore body by means of bore holes instead of core holes. As core holes cost 2–3 times as much as bore holes, the new, more reliable gamma-logging equipment quickly pays for itself by reducing the exploration costs.

JOSEPH KAPLAN, Professor of Physics (UCLA) and chairman, U. S. National Committee for the IGY
International Geophysical Year

The United States program for the International Geophysical Year is part of a world-wide scientific undertaking by more than 50 nations in an internationally planned and coordinated effort to study geophysics on a truly global scale during the period of high solar activity, 1957–1958.

The second general assembly of the CSAGI, the international committee for the IGY, in Rome in the fall of 1954, developed criteria for the selection and planning of observational programs in the individual geophysical disciplines. Each participating nation followed these criteria in planning its own program. The major emphasis is given to problems requiring concurrent synoptic global observations involving coordinated efforts by many nations. Also of great importance are the activities undertaken in remote regions of the earth, such as the Antarctic, the Arctic, and the vast oceanic areas.

In the United States, the National Academy of Sciences, as the adhering body of the U. S. scientists to the International Council of Scientific Unions, established the United States National Committee for the International Geophysical Year. This committee, with its technical panels and regional committees, is responsible for the planning, direction, and execution of the U. S. program. The membership of the technical panels and committees is made up of scientists drawn from private, governmental, educational, and research institutions from all over the country. Department of Defense research and logistics efforts are being utilized in certain areas to supplement and expand the IGY activities.

Closely following the criteria established by the CSAGI, the USNC-Technical Panels developed programs in Meteorology, Geomagnetism, Aurora and Airglow, Ionosphere, Solar Activity, Cosmic Rays, Longitude and Latitude, Glaciology, Oceanography, Rocketry, Seismology, and Gravity, and, as announced by the President of the United States on July 29, 1955, scientific studies using earth-circling satellites. Activities in these programs range geographically from the Arctic to the Antarctic, throughout all of the continental United States, its territories and possessions, and parts of the Atlantic and Pacific oceans, penetrating deep into the earth, oceans, and ice, and high into the atmosphere.

The planning of this vast program is now nearing completion: the execution of the program and the analysis of the ensuing data will involve scientists from institutions throughout the country. The IGY will afford unprecedented opportunities for participation and achievement by scientists and their institutions and should constitute the greatest peace-time stimulus yet to geophysics.

As comprehensive and far-flung as the U. S. program is, it is only part of the international effort. It may well be that the "large view," so typical in astronomy and global geophysics, attendant on the mutual and fruitful cooperation of most of the world in the IGY, will eventually give the IGY a value far transcending the gathering of data and the observation of physical processes.

CHARLES F. PARK, JR., dean of the School of Mineral Sciences, Stanford University, California
Training of Geologists

How can geology attract and train the best high-school graduates? The competition for potential leaders in science is keener than ever. Geology obtains a small part of the good science students, but needs to be better known in high schools.

High-school and undergraduate college training should enable a student to assume a responsible place as a citizen. Ideally he should have breadth of training, he should write well, and he should have a core of solid knowledge upon which to build in future years. Four years are insufficient for adequate training of a geologist for independent work. At least a fifth year of concentrated study in his specialty is necessary. For research and teaching the student needs to obtain a doctorate degree. Geology, more so than the exact sciences and engineering, requires careful weighing of sometimes tenuous evidence. Small classes and close contact with experienced men are recommended.

Successful geologists must be enthusiastic about their science, and their moral integrity must be unquestioned. They must also have ideas and imagination, and possess the courage and drive to implement these ideas.

Industry is becoming increasingly aware of the need to support higher education. Many ways of extending such help exist.

J. P. ROCKFELLOW, manager of employment, Union Oil Company of California
Jobs and Geologists

A planned and well organized recruitment program is essential to a company requiring technically trained college graduates in the present era of scarcity. Not only must the job seek the man, but the recruiter must schedule his interviews in compliance with college routines as varied as the colleges themselves.

In general, the recruiting program must know its company's manpower needs; where people with the essential training are likely to be found; how and when to conduct interviews; and how to successfully conclude an offer.

The technical recruit is examined as to his scholastic progress, intelligence, mental alertness, physical fitness, social likes and dislikes, initiative, experience, and general character traits. The geological recruit, in addition, is classified as to the depth of his geological interest and his potential development.

The employing of a recruit is only the beginning. It must be followed by proper introduction to the company; a broad introductory training schedule; wise supervision; and the affording of opportunities that will utilize the recruit's knowledge and holds his interest.

The field of petroleum geology, like most other fields of endeavor, is crowded at the bottom with students who hold "degrees" but begging at the top for men who can find oil.

WALLACE E. PRATT, past vice-president, Standard Oil Company (New Jersey)
Geologist's Long-Term Forecast of Petroleum Supply and Demand

The petroleums—oil and natural gas—have been called upon during the past 20 years to assume a constantly increasing share of the burden of supplying the energy demand of this country. Over the same period this total demand has doubled. At present the petroleums furnish two-thirds of all the energy consumed in the United States. Twenty years hence, in 1975, the petroleum industry expects demand for these fuels still to amount to two-thirds of our total energy requirements. These figures mean that demand for energy in the form of oil and natural gas has trebled over the last two decades and will double again over the next two. In the rest of the Free World the situation is similar, but even more aggravated.

Throughout the history of the petroleum industry, a period now almost a century long, this country and its government have manifested recurrent anxiety as to the adequacy of our petroleum resource. This anxiety prevails widely again to-day in the face of an imminent future demand of unprecedented proportions. Some of the most esteemed, best informed students of the petroleum industry have recently concluded, independently of each other, that the all-time peak of petroleum production in the United States will have been attained within the next 10 years. In the face of these predictions how can the industry hope to meet a multiplying demand over the next 20 years?